

Unacceptable Risks: UK-relevant reports on the humanitarian consequences of nuclear weapons



The 2010 Review Conference of the 1968 Non-Proliferation Treaty (NPT) adopted a consensus document that expressed “deep concern at the catastrophic humanitarian consequences of any use of nuclear weapons”. Over the 67 years since two atom bombs were detonated on Hiroshima and Nagasaki in August 1945, nuclear weapons became the subject of an array of military doctrines and political arguments, with countervailing claims, purposes and myths. Arsenal numbers rose and fell, but the dangers of nuclear weapons being accidentally or intentionally detonated have not diminished.

Today, with the non-proliferation regime in perennial crisis and nuclear weapons still posing unacceptable risks, nations are reconsidering what would happen if nuclear weapons were used again and what could be done to prevent such a catastrophe from occurring.

Norway’s Foreign Minister Espen Barth Eide has invited the foreign ministers of all states to send relevant experts to participate in an international governmental conference on the humanitarian impact of nuclear weapons in Oslo, 4-5 March 2013. The aim of the conference is “to provide an arena for a fact-based discussion of the humanitarian and developmental consequences associated with a nuclear weapon detonation. All interested states, as well as UN organisations, representatives of civil society and other relevant stakeholders are invited to the conference.”

Following up, the UK network of the International Campaign to Abolish Nuclear Weapons (ICAN UK) wrote to Foreign Secretary William Hague on 29 November to urge the British government to participate and provide analyses on the anticipated casualties and consequences of nuclear weapons, including any response plans to help the injured and survivors. ICAN suggested three possible indicative scenarios that the UK government ought to consider, given its position as a nuclear-weapon producer and nuclear-armed state:

- the intentional detonation of a nuclear warhead by another country on a major UK city;
- a nuclear accident in the UK in or around nuclear warhead production, transport or storage facilities, such as the Atomic Weapons Establishment (AWE) Aldermaston and Burghfield (50 miles west of London in Berkshire) or the Royal Navy’s nuclear warhead storage depot at Coulport, which is located close to the Faslane home-port for the submarines carrying Trident nuclear weapons in Scotland; and
- the use of Trident against another country.



By updating earlier research and drawing on the resources of ICAN UK members, notably Article 36, Medact, Scientists for Global Responsibility, Acronym Institute for Disarmament Diplomacy, Nuclear Information Service, CND and Scottish CND, we have pulled together a series of short studies relevant to the scenarios we asked the government to consider. With a tight time frame before Oslo, we called on past and present expertise from relevant fields and used the best data and analyses we could find in public sources on nuclear weapons detonations and effects, including longer term radiation and climate effects, looking also at the emergency resources and services that would have to deal with a nuclear crisis.

This briefing summarises the principal findings and implications. The full reports are available from ICAN UK and via the authors’ institutional websites (see below). They do not purport to be definitive, but offer relevant analysis of what might be faced by survivors, emergency responders and decision-makers. We hope they will stimulate debate about these important issues among the governing and opposition parties, MPs, media and public. As more and more governments move towards a multilateral process to ban nuclear weapons – and before billions of pounds of British taxpayers’ earnings are spent on replacing Trident – we call for an open public debate about what needs to be done to prevent such “catastrophic humanitarian harm” from occurring.

Scenario 1: Detonation of a single 100kT warhead on Manchester

The first case study, authored by Richard Moyes, Philip Webber and Greg Crowther, considers the detonation of a nuclear warhead on Manchester measuring 100kT (kilotonnes). With an explosive power of a hundred thousand tonnes, this bomb would create blast and thermal effects that would cause around 81,000 immediate deaths, leaving 212,000 injured, and destroying vital infrastructure, hospitals, housing and commercial buildings. The capacity of medical and local emergency services would be severely degraded. In the case of a weapon exploding at ground level, radioactive fallout would inflict further health effects and hamper efforts to help the survivors, including large numbers of injured, homeless and displaced people. Even outside the zones of direct damage, systems of communication and transport would be left inoperable, while people fleeing the disaster would overwhelm services in the rest of the country.

The capacity of emergency and health services to provide a meaningful response would be minimal and the long-term impact on the psychological, social and economic fabric of UK society would be massive.

Illustrating just one small but essential aspect – the vital delivery of blood transfusion services to the injured – Dr Frank Boulton, former Chair of the UK Standing Advisory Committee on the Care and Selection of Blood Donors and advisor on blood transfusion to the UK Armed Forces, notes that due to high levels of burn, blast, shock and trauma injuries, there would be very high clinical demand for blood transfusions and intravenous fluids, plasma, clotting factors and the personnel and infrastructure to deliver them safely and effectively.



Even with the limited case study of a single 100 kT nuclear detonation on Manchester, medical and blood transfusion services would be quickly overwhelmed, with the added complexity of radiation-induced problems for survivors and responders, ranging from acute sickness to immune suppression and impaired healing. As a consequence, many “short-term survivors” would succumb, unable to receive the help that could save their lives. In the event of multiple detonations, such as a regional nuclear war, Dr Boulton argues that there would be massive disruptions to transport, trade, computing and communications services that would severely restrict the ability of outside providers to assist in delivering blood and other vital medical services to afflicted areas.

Scenario 2: Radiological accident at AWE Aldermaston or Burghfield

Nuclear engineer John Large prepared a report last year for the Reading-based Nuclear Information Service on the off-site emergency planning arrangements in place for AWE Aldermaston and Burghfield. This looked at the review by the Office for Nuclear Regulation (ONR) on the implications of the March 2011 disaster at Japan’s Fukushima nuclear power plant for the UK’s own nuclear installations, focussing on the risks of radiation release due to explosions or fires. Documenting the inadequate plans, preparations and emergency response capabilities at AWE and in the local area, Large castigates the “pervading sense of ‘muddling through’”. Noting that when a serious fire broke out in August 2010 in the Aldermaston explosives area, local fire-fighters were held back from tackling the emergency because the AWE “did not have a sufficient number of personal dosimeters on the Aldermaston site to equip each fire-fighter”, Large’s report exposes the poor level of preparedness and capabilities to respond even to relatively small scale nuclear accidents. This raises serious questions about how the fire and emergency services would cope if faced with more severe incidents, including an accidental or intentional nuclear detonation.



Scenario 3: If Trident were fired

In accordance with current policy, the Royal Navy is supposed to deploy at least one nuclear-armed submarine at all times on “continuous at-sea deterrence” patrol. Each submarine is equipped with US-made Trident missiles and a reduced complement of 40 warheads, designed to deliver explosions of 100 kT, though lower yield variants may also be available. The entire system is generally abbreviated to “Trident”.

John Ainslie’s study reveals the direct and appalling consequences of a specific and limited scenario based on the “Moscow criterion”, conceived in the Cold War when it was deemed necessary to show Soviet leaders that the UK was capable of obliterating Moscow. Twenty years after the Cold War ended – and notwithstanding recognition by Deputy Prime Minister Nick Clegg and others that Britain does not need to be able to “flatten Moscow” – the assumptions underlying the Moscow criterion still influence government discourse on replacing Trident, with the MoD’s critical construction decision (‘Main Gate’) now scheduled for 2016. Focussing on Moscow as an indicative scenario therefore remains relevant. Without implying that this is a sole target for Trident, Ainslie’s report for Scottish CND provides food for thought to inform both the UK debate and international consideration of the effects of multiple nuclear warheads being detonated on a major city.

If 40 British warheads were fired at targets in and around Moscow, Ainslie calculates they would cause 5.4 million direct deaths during the first few months, principally from blast, fire and acute radiation poisoning. Residential tower blocks would be shattered, and extensive fires and firestorms would incinerate schools, hospitals and homes across a wide area. Radioactive fallout would affect populations at greater distances, depending on weather and wind conditions. Moscow would be effectively destroyed, its communications, transport and infrastructure crippled, and its hospitals wrecked or incapacitated.

Dr Philip Webber takes the Moscow criterion one step further, with consideration of the wider climatic impacts and humanitarian problems if the nuclear weapons on one UK submarine were launched. If targeted at Russia’s five largest cities, namely Moscow, St Petersburg, Novosibirsk, Yekaterinburg and Samara, Trident could cause the direct deaths of 10 million people and put many more at risk from injuries and radiation poisoning. The human suffering would be compounded by severely impaired medical and emergency services being unable to provide significant help to survivors. Webber analyses how detonating nuclear weapons on major cities – whether in Russia, China, the Indian sub-continent or anywhere else – would pulverise buildings, create huge fires and loft massive quantities of sooty smoke into the atmosphere which would circulate globally, reducing heat and light from the sun for several years.



Citing studies that have recently been published on the environmental and agricultural impacts of a hundred Hiroshima-sized bombs (approximately 15 kT each, with an aggregate explosive power of 1.5 MT – i.e. 1.5 million tonnes) being used on cities, Dr Webber concludes that if the firepower from one Trident-armed submarine were used on urban areas in accordance with current doctrines and policies, the consequences would include a catastrophic level of climate disruption that would adversely affect agriculture, natural ecosystems and the food resources of millions of people around the world. One study he cites, by US physician Ira Helfand, calculates that famine and disease could kill up to a billion people after a “limited” regional nuclear war in which less than 1 % of today’s arsenals were used. While more research is clearly needed to assess the regional and global consequences of using Trident, including “blowback” effects for Britain, Dr Webber argues that “deploying a weapon capable of devastating the world’s climate system is a grossly disproportionate, and perhaps even suicidal, response to uncertain future security concerns”.

Imperative to Prevent Nuclear Catastrophe

These studies are just the tip of the iceberg. The facts about the scale of destruction, death and suffering caused by nuclear detonations on Manchester or Moscow are shocking. Most people prefer not to think about the effects of nuclear detonations, but these studies show that we must. It is irresponsible of leaders to hide behind glib assertions that “the point of having nuclear weapons is to deter people and not to use them...” (David Cameron, 2010) or that they are an “ultimate insurance” (Tony Blair, 2006). Deterrence is not a property of the weapons but a relationship between adversaries. The “use them or lose them” logic and quick, computerised, launch operations associated with nuclear deterrence policies makes it more rather than less likely that nuclear weapons will be used, especially in times of conflict, uncertainty and mistrust.

Based on conservative parameters, ICAN UK's case studies demonstrate the catastrophic humanitarian harm that just one or a few nuclear weapons would create. Still greater dangers attach to the risks that an unforeseen or badly managed conflict involving nuclear-armed leaders could escalate into nuclear war. Even if this were able to be limited to one region, the consequences would be global. Millions of people in countries far from the weapons' intended targets would suffer from contamination, climate disruption and nuclear-induced famine. As long as nuclear weapons are deployed, the risks of nuclear use and war remain unacceptably high.

Other weapons of mass suffering – biological, toxin and chemical weapons – have been prohibited, as have several types of conventional weapons categorised as inhumane. In view of the appalling humanitarian and environmental effects of nuclear detonations, it is extraordinary that nuclear weapons of mass destruction have not yet been explicitly outlawed. This anomaly persists because of institutional contradictions and Cold War attitudes. These treat the participation of states that have armed themselves with nuclear weapons as essential before a process to ban such weapons can be taken forward. By contrast, history shows that changing/clarifying the legal status of weapons generally precedes and facilitates the processes of stockpile elimination. Allowing the legal status of nuclear weapons to continue to be dictated by the countries that wield them is a mistake that compromises the security of all people in the world.

If we want to prevent the humanitarian catastrophe and suffering that nuclear weapons detonations would cause, we need to act now. Concerned states, in partnership with civil society and relevant organisations, should establish an international legal prohibition on the use, production, deployment, stockpiling and transfer of nuclear weapons, and on assistance with such prohibited acts. Taking forward a concerted process to outlaw nuclear weapons, with or without the participation of the current nuclear-armed governments, will reduce proliferation incentives and contribute to creating the conditions for nuclear arsenals to be comprehensively and verifiably eliminated. This is the next logical step towards achieving a more secure “world without nuclear weapons”, as enshrined in many UN General Assembly and Security Council resolutions as well as the 2010 NPT Review Conference consensus agreements.

Reports from ICAN UK

- **Richard Moyes, Philip Webber and Greg Crowther, *Humanitarian consequences: Short case study of the direct humanitarian impacts from a single nuclear weapon detonation on Manchester, UK.* Article 36, February 2013.**
- **Frank Boulton, *Blood Transfusion Services in the wake of the humanitarian and health crisis following multiple detonations of nuclear weapons,* Medact, February 2013**
- **John Large, *The Lay-person's Alternative Guide to REPPIR Relating to the Atomic Weapons Establishment (AWE) Aldermaston and Burghfield,* Nuclear Information Service, April 2012**
- **John Ainslie, *If Britain Fired Trident: The humanitarian catastrophe that one Trident-armed UK nuclear submarine could cause if used against Moscow,* Scottish CND February 2013**
- **Philip Webber, *The climatic impacts and humanitarian problems from the use of the UK's nuclear weapons,* Scientists for Global Responsibility, February 2013 (revised from SGR Winter 2008)**

Further reading:

- **Ira Helfand, *Nuclear Famine: A Billion People at Risk,* IPPNW, 2012.**
- **Alan Robock, Luke Oman, Georgiy L. Stenchikov, Owen B. Toon, Charles Badeen and Richard P. Turco, *Climate consequences of regional nuclear conflicts,* *Atm. Chem. Phys.* 7 (2007)**
- **Rebecca Johnson, John Borrie and Tim Caughley, *Decline or Transform: Nuclear disarmament and security beyond the NPT review process,* Acronym Institute for Disarmament Diplomacy, April 2012**

For further information:

www.icanw.org/unitedkingdom
www.acronym.org.uk
www.article36.org
www.banthebomb.org
www.cnduk.org
www.medact.org
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